



PPSP Lab

Faculté de médecine

Université
de Montréal



Mila



Centre de recherche
CHU
Sainte-Justine
Le centre hospitalier
universitaire mère-enfant

Position: Postdoc — **Laboratory:** Precision Psychiatry & Social Physiology

Job Description:

As a Postdoc in our esteemed lab, you will be pivotal in implementing and testing state-of-the-art Multi-Agent Reinforcement Learning techniques. Working alongside an interdisciplinary team of researchers, you will drive the development of innovative approaches using multi-agent reinforcement learning and scientifically grounded models. Your primary focus will be on applying MARL to sustainable water management and adaptation strategies for the effects of climate change.

Job environment:

The city of Montréal serves as a global hub for cutting-edge research at the intersection of AI and neuroscience, particularly in the realm of computational psychiatry. Montréal has a vibrant and interdisciplinary academic community and leading institutions such as Mila – Quebec AI Institute and the UNIQUE Center (Unifying Neuroscience and Artificial Intelligence in Québec), which consists of more than 80 researchers affiliated with several universities and research centers from different regions of the province and outside. Montreal is also fueled by a rich ecosystem of startups, tech companies, and academic collaborations, providing unparalleled opportunities for interdisciplinary work and innovation. As a member of our team, you will have the unique advantage of being immersed in this dynamic environment, collaborating with world-renowned experts, and contributing to groundbreaking research.

Responsibilities:

- You will take the lead in implementing and developing multi-agent reinforcement learning algorithms in Python, showcasing expertise in PyTorch and a solid understanding of TensorFlow.
- Designing and conducting experiments using deep generative models to simulate hydrological systems (using the Raven hydrological modeling framework), modeling social behaviors and interactions will be a central aspect of your role.
- Through the application of inverse reinforcement learning, you will gain valuable insights into latent human preferences and values.
- Collaborating effectively with other team members, you will analyze experimental results and contribute to academic publications.
- We foster a culture of innovation, so your contributions of creative ideas and input into the research direction will be highly valued.

Requirements:

- You should possess a Ph.D. degree in Computer Science, Computational Social Science, or related fields.
- Strong programming skills in Python, along with experience in deep learning frameworks, particularly PyTorch, are essential.
- A thorough understanding of reinforcement learning algorithms and their applications is required.
- Demonstrated interest in social learning, attention mechanisms, and transformer architectures is highly desirable.
- Eagerness to learn and adapt to new challenges is a highly valued characteristic in our team.



PPSP Lab

Faculté de médecine

Université de Montréal



Mila



Centre de recherche
CHU
Sainte-Justine
Le centre hospitalier
universitaire mère-enfant

Preferred Qualifications:

- Experience with multi-agent reinforcement learning and an understanding of its unique challenges will be considered a significant advantage.
- Prior exposure to inverse reinforcement learning methods and attention mechanisms will benefit this role.
- You have worked with or are open to working with researchers in other disciplines, including climate science, sociology, and cognitive science, and have proficiency or interest in publishing your work in general-audience journals.

EDI:

The PPSP lab is committed to creating a diverse, inclusive, and equitable environment as does its community, and abides by the same [code of conduct](#) of UNIQUE Center to this end. We encourage candidates of any ethnic origin, disability, gender identity/preference, sexual orientation/preference, religion, personal differences of any kind, or belonging/identifying to a minority or marginalized group ([as defined by the government of Canada](#)) to post their candidacy.

Benefits:

- This role presents a unique opportunity to work on cutting-edge research projects at the intersection of AI and AI alignment and safety for artificial systems.
- You will gain invaluable experience in developing innovative algorithms and models.
- You will have access to an interdisciplinary project team combining expertise on AI, climate science, and the social sciences.
- We offer a competitive compensation and benefits package.

Application Instructions:

To apply for the position of Research Assistant in the Precision Psychiatry & Social Physiology lab, please submit the following documents to [guillaume.dumas@ppsp.team]:

1. An up-to-date CV or resume highlighting relevant educational background and work experiences.
2. A cover letter outlining your interest in the position and your research experience in deep learning, reinforcement learning, and social learning.
3. Academic transcripts (unofficial copies are acceptable).
4. Optional: Up to 3 writing samples of your published or unpublished work.
4. Optional: Any links to GitHub repositories or attachments showcasing relevant personal or academic projects.

Application Deadline: April 30th, 2024

If you possess the passion and skills we are seeking, we encourage you to apply and become a part of our exciting research journey!